CLAIMS

24. (*New*) A neuronal device for modulating neuronal activity, said device comprising:

(a) a housing having a surface biocompatible with at least a portion of a neuronal cell;

(b) an aperture in said surface; a reservoir connected to said aperture; and

(c) a flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture.

25 (*New*) The device according to claim 24, wherein said flow regulator is an electrical device.

26 (*New*) The device according to claim 24, wherein said surface is micropatterned for directing a neuronal process toward said aperture.

27 (*New*) A neuronal device for modulating neuronal activity, said device comprising:

(a) a housing having at least one aperture;

(b) a surface biocompatible with at least a portion of a neuronal cell and micropatterned for directing growth of a neuronal process to said aperture;

(c) a reservoir connected by a channel to each said aperture; and

(d) an electrically controlled flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture.

28. (*New*) The device according to claim 27, wherein said micropattern comprises bioactive agents and directs growth of said neuronal process to said aperture.

29. (*New*) The device according to claim 27, wherein said device is of a size to fit into a subretinal or epiretinal site.

30. (*New*) The device according to claim 27, wherein said device comprises at least one photodiode.

31. (*New*) The device according to claim 27, having a well in said surface, said aperture opening into said well.

32. (*New*) A neuronal device for modulating neuronal activity, said device comprising:

(a) a housing of a flexible material having a surface biocompatible with at least a portion of a neuronal cell;

(b) an aperture in said surface;

(c) a reservoir connected to said aperture; and

(d) a flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture.

33. (*New*) The device according to claim 32, wherein said flexible material is a polysiloxane.

34. (*New*) The device according to claim 32, wherein said device is comprised of two layers:

(a) a first layer comprising at least one reservoir and at least one channel, each reservoir connected to a channel; and

(b) a second layer covering said first layer enclosing said reservoir and channel and having an aperture in communication with said reservoir.

35. (*New*) The device according to claim 34, wherein said second layer is micropatterned for directing growth of a neuronal process to said aperture.

36. (*New*) The device according to claim 32, wherein said flow regulator is an electrical device.

37. (*New*) The device according to claim 36, wherein said device comprises photodiodes and said electrical device is actuated by photodiodes.

38. (*New*) A neuronal device for modulating neuronal activity, said device comprising:

(a) a housing having a surface biocompatible with at least a portion of a neuronal cell;

(b) an aperture in said surface; a reservoir connected to said aperture; and

(c) a flow regulator in operable relationship with fluid in said reservoir for moving said fluid to said aperture, wherein said neuronal device comprises at least one of a flexible housing, a flexible membrane pump or a light sensitive polymer flow regulator.